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REVISED M E M O R A N D U M FOR 2nd DRAFT PERMIT MODIFICATION

TO: David Anderson, Engineering Manager
Twin Falls Regional Office

FROM: Olga Cuzmanov, Associate Engineer
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SUBJECT: Request for modification of The Amalgamated Sugar Company (TASCO) Wastewater-Land Application Permit Application Review (Paul, ID) -- LA-000050-02 (Sugar Beet Processing Wastewater)

Project Description

The Amalgamated Sugar Company LLC (TASCO), Mini-Cassia Facility, has requested to modify the existing Wastewater Land Application Permit. TASCO purchased the Goitiandia (MU-005004) and East Gillette (MU-005005) offsite management units and requests to transfer these land application farms to onsite management units. The purchase of the offsite acreage is considered to be an improvement to the existing land application system since: 1) Nutrient applications including fertilizers will be strictly monitored and controlled and 2) TASCO will manage the land as a wastewater land application system. TASCO also requests to modify the total permitted hydraulic application rate.

Facility Description

The TASCO Paul sugar beet processing facility is located about 1.2 miles northeast of Paul, Idaho. A total of 225 million gallons of wastewater (process water and condensate water) are currently permitted to be land applied on 518 owned acres (Onsite acreage) and 395 leased acres (Offsite acreage). The facility reports that over the past five years an average of 97 MGA of wastewater was land applied (approximately 14% of process water and 86% condensate).

Summary of Events

The facility received a Wastewater Land Application Permit (WLAP) on June 13, 1989 and was re-permitted on July 5, 1996. The current permit was modified on November 27, 1996 incorporating additional condensate treatment acreage and allowing land treatment of wastewater on acreage loaded at *de minimis* rates. The current permit was further modified on April 14, 1997 to reflect a change of ownership. In a letter dated October 23, 1998, TASCO notified DEQ of its intent to utilize the South Schow acreage at *de minimis* rates according to Schedule A no.7 of the current permit (see Appendix 'B'). TASCO submitted an application for re-permitting the site on April 3, 2000. Additional application materials were received on May 3, 2000. DEQ issued three draft modifications in response to the Application. These draft modifications and associated staff analyses concerned of the permitting of the Schow Expansion Acreage (DEQ, June 26, 2001), remediation of ground water at the Pond and Facility Complex (DEQ, June 25, 2001), and resolution of Well Location Acceptability Analysis issues (DEQ, June 27, 2001). A draft wastewater land application permit was issued on April 18, 2003 for public comment. Comments to the draft permit were received from TASCO on August 31, 2003. Currently, the Department is in process of preparing another draft permit incorporating those comments.

At the beginning of December 2002, TASCO purchased Gillette farm (MU-005005) and one year later in December 2003 purchased Goitiandia farm (MU-005004). Both sites were permitted in 1992 as Off-site acreage, for the irrigation of condensate water during the non-growing season. Currently, TASCO owns 518 acres and has the option to irrigate an additional 395 offsite acres permitted for non-growing season operation, for a total of 913 permitted acres, as described above.

The facility is currently in process of modifying the process in order to increase the beet slicing capacity. The increase in slice capacity will result in an increase in the amount of condensate produced. In order to properly manage the additional water, TASCO proposed to install an eighty (80) million gallons lined storage pond and land apply the condensate water during both growing and non-growing season. IDEQ has approved the installation of the 80 million gallons lined pond. The sites to be irrigated include the farms purchased from the off-site acreage owners: Goitiandia (MU-005004) and Gillette (MU-005005). Currently the condensate is irrigated for the most part during the non-growing season. TASCO anticipates that there will be no increase in the amount of process water due to the beet slice increase. TASCO is requesting a permit modification to allow growing season irrigation of both condensate and process water to Gillette and Goitiandia sites. Proposed *de minimis* NVDS loading rates will restrict process water land application rates to accepted environmental guidelines. A Permit Modification Request was submitted on March 3, 2006 and additional information was received on May 12, 2006 in response to DEQ's comments of April 10, 2006. A draft permit modification was issued for public comment and TASCO submitted a comment letter on September 15, 2006 and additional information on September 29, 2006 and October 11, 2006.

The following table shows the current and proposed loadings by TASCO for the Goitiandia and Gillette farms in the Permit Modification (2006):

	Current Permitted Loadings	2006 Permit Modification Proposed Loadings by TASCO
Wastewater Loading (Total) (ac-in/ac-yr)	9.5	Crop Consumptive use divided by Irrigation Efficiency
Wastewater Loading (NGS) (ac-in/ac-yr)	9.5	9.5
NVDS (lb/ac-yr)	642 GS 642 NGS	4000 Total[1] 642 NGS
Wastewater COD (lb/ac-yr)	50 GS 25 NGS	50 GS 25 NGS
Wastewater Nitrogen (lb/ac-yr)	150% of crop uptake or 300 lbs/ac-year	150% of crop uptake or 300 lbs/ac-year
Wastewater Nitrogen (NGS) (lb/ac-yr)	No limit	No limit
Phosphorous (lb/ac-yr)	150% of crop uptake	No limit

Notes: 1 Includes supplemental irrigation NVDS loading

The sections below discuss proposed constituent loading rates, including nitrogen, non-volatile dissolved solids, chemical oxygen demand (COD), phosphorus and hydraulic loading limits. Requested limits are consistent with IDEQ wastewater land application guidance levels and best management practices. The recommended limits for inclusion into the draft permit modification are also discussed.

Nitrogen Loading Rates

The annual nitrogen loading rate proposed in the 2006 Permit Modification Application for Goitiandia (MU-005004) and Gillette (MU-005005) sites is 150% of crop uptake or 300 lbs/ac-year. The Department recommends that the nitrogen loading for the permit modification is a yearly 150% of crop uptake and 150 lb/ac for the NGS.

Non-Volatile Dissolved Solids Loading Rates

The Permit Renewal Application proposes a *de minimus* non-volatile dissolved solid (NVDS) loading rate of 642 lb/ac for Goitiandia (MU-005004) and Gillette (MU-005005) sites. At the time when the Application was submitted (year 2000) the management units were typically irrigated only with condensate water during the NGS. In the Permit Modification the proposed loadings are:

- 4000 lb/ac-year for GS and NGS (includes wastewater and supplemental irrigation water)
- 642 lb/ac during NGS (for wastewater irrigation only).

It appears that the proposed NVDS loadings are at levels well below regulatory concern. Consequently, the recommended NVDS loadings are same as those proposed by TASCO.

Hydraulic Loading Rates

TASCO proposes in the Permit Renewal Application (2000) and the Permit Modification (2006) that the growing season (GS) hydraulic limit loading should be crop consumptive use divided by irrigation efficiency. The Department recommends for the Permit Modification that the limit would be the irrigation water requirement (IWR) since the crop consumptive use does not take into consideration effective precipitation (PPTe). TASCO requested that following language be added in the definition for the calculation of IWR: "The terms CU, P_e, and E_i can be determined by site specific values or other scientifically justified values." The language was added in Note 3 (to the table) in Schedule A, item 10 of the draft modification.

The proposed wastewater non-growing season (NGS) hydraulic loading limit of 9.5 inches is based on the current permitted limits. TASCO provided site specific data which calculates a NGS loading limit of 9.88 inches. Based on projected non-growing season wastewater loading rates, TASCO can operate in accordance with the more conservative 9.5 inch HLR limit.

As discussed in the comments to the first draft modification, TASCO also requests that the 225 MG hydraulic limit be deleted. This limit is not adequate for the current available acreage and loading limits. Hydraulic loading limits based on crop consumptive use and nutrient loads are much greater than 225 MG. The total amount of land now permitted, 913 acres is 375 acres more than when the total hydraulic limit was previously established. Therefore, the Department will eliminate the total annual hydraulic loading limit.

COD Loading Rates

Guideline growing season COD loading rates of 50 lb/acre-day and non-growing rates of 25 lb/acre-day are proposed in both the Permit Renewal Application (2000) and Permit Modification (2006). It is recommended that proposed loading rates be incorporated into the draft permit modification.

Phosphorus Loading Rates

Currently the maximum phosphorus loading rate is 150% of crop uptake. The Permit Modification request (2006) does not specify any loading limit. Phosphorus loading does not represent an environmental concern due to very low wastewater loading. However, until the issuance of the new permit, it is recommended that the phosphorus loading continue to be monitored and the current loading rate be maintained: 150% of crop uptake.

Ground Water

The evaluation of the current ground water network for the entire site including Goitiandia and East Gillette farms as well as the evaluation of the NGS loading rate will be addressed in the permit renewal process.

As discussed in Section 4.5.14 Ground Water Impacts-Offsite Acreage of the staff analysis accompanying the draft permit dated April 7, 2003: "Ground water quality of the Offsite acreage is discussed in the Application (page 54), and trend plots appear in Figure 4-8. Offsite acreage has only a minimal monitoring well coverage…"

The present monitoring well network that is serving the Offsite acreage (Goitiandia and East Gillette currently included) does not appear to be adequately measuring ground water responses from land treatment activities. As stated in the Application (page 68), it would be "*difficult to determine the relationship between loading rates, soils, and groundwater concentrations* (of Offsite Acreage) *using these wells* (i.e. Wells A, 107 and 112*)."* It is recommended that the current network be evaluated, and modified as needed so that it can effectively monitor the environmental performance of the Offsite Acreage.

However, the proposed loading limits for the permit modification are designed to be protective of the groundwater.

Buffer Zones

TASCO requested in the comments to the draft permit modification that the buffer zones be eliminated, based on the information presented in the Buffer Zone Plan submitted on May 1, 1997. The Department reviewed the Plan and for the interim period, until the

current permit is renewed, following are the new proposed buffer zones for Goitiandia and East Gillete properties.

Condensate water is water produced from evaporation and concentration of sugar juices with a low Total Coliform count (for example less than 18 CFU/100 ml for the sample dated December 13, 1995). This type of wastewater does not appear to pose a health concern (no potentially pathogenic microorganisms) or cause adverse odors. Alternative buffer zones from the general guidance are recommended for this type of wastewater:

- Inhabited Dwellings: 75 feet or more
- Public Access Areas: 15 feet or more
- Natural Surface Waters: 25 feet or more
- Man-made Surface Waters: 15 feet or more
- Private Wells: 125 feet or more
- Public Water Supply Wells: 250 feet or more
- Irrigation and Monitoring Wells: 5 feet or more

Process Water is a combination of water used to flume beets into the factory, equipment blowdown, settling pond water and wash down water. This wastewater may have a high Total Coliform content and a potential for odors, due to the high organic content. The process water is sent to aerated ponds for treatment before is land applied. Wind drift calculations were performed by Dr. Dennis Kincaid of the University of Idaho Research Center. Dr. Kinkaid's program determines the maximum distance at which drift (droplets equal or larger than 200 mm in diameter) will fall on the ground. This accounts for 99% of the droplets formed by the sprinklers. The maximum drift distance calculated was 89.9 feet for 20 miles/hour (9m/s) wind speed, for predominant wind direction out of the west and south west. In the case of the Goitiandia and Gillete properties, it was assumed that the wind direction may also be out of south and/or east. To ensure that the drift would not fall beyond the borders of the neighboring dwellings, alternative buffer zones from the general guidance are recommended for this type of wastewater:

- Inhabited Dwellings: 100 feet or more
- Public Access Areas: 15 feet or more
- Natural Surface Waters: 30 feet or more
- Man-made Surface Waters: 15 feet or more
- Private Wells: 150 feet or more
- Public Water Supply Wells: 300 feet or more
- Irrigation and Monitoring Wells: 10 feet or more

Compliance Activities

The compliance activity requiring that the soil Available Water Holding Capacity (AWC) be determined for each farm was removed from the draft permit modification. TASCO

provided this information on October 11, 2006 and the Department determined that the data provided was acceptable.

The compliance activity requiring an update of the "Cash Rent Farm Lease" for Goitiandia and Gillette farms was removed. TASCO stated in the comments to the draft permit modification that "assumes full responsibility for the management of the onsite farms. To ensure compliance with the conditions of the Wastewater Land Application Permit, TASCO shall oversee and monitor all farmers which lease TASCO owned farms".

Monitoring Requirements

In the comment letter, TASCO requested that the daily measurement of supplemental irrigation water utilizing either a flow meter or calibrated pump rate be eliminated from the permit modification. The measurement or estimate of supplemental irrigation water is required in Schedule B of the current permit on a monthly basis. The daily measurement requirement was removed from the monitoring section of the draft permit.

A new requirement was added in the monitoring section: Total Coliform analysis of the condensate water performed weekly when irrigating. The Buffer Zone Plan submitted by TASCO on May 1, 1997 provided Total Coliform analysis results between 2 and 18 CFU/100 ml for the condensate water. The low Total Coliform data was considered when the buffer zones were established for this type of water. The current proposed buffer zones may be modified if the data shows consistent increases of the Total Coliform.

Conclusions and Recommendations

The purchase of the Goitiandia and Gillette farms gives TASCO full operation control of the sites. This will allow for an improved management of the wastewater land application system. Therefore, DEQ staff recommends that the permit modification request be issued. The draft permit modification contains loading limits for nitrogen, non-volatile dissolved solids, chemical oxygen demand, growing and non-growing season hydraulic loading rates protective of the groundwater.

It is recommended that the hydraulic management units be managed and loaded hydraulically during the NGS as calculated in TASCO's letter dated October 9, 2006. The maximum COD loading rates should be set as proposed: 50 lb/acre-day GS and 25 lb/acre-day NGS. The maximum N loading rates should be set as proposed in the permit renewal application and permit modification: yearly value of 150% of crop uptake and not to exceed 150 lb/ac during NGS. The maximum NVDS loading rates should be set as proposed in the permit modification request: yearly total 4000 lb/ac and 642 lb/ac during the NGS.

As discussed in Section 5.2 Ground Water Related Recommendations of the staff analysis accompanying the draft permit dated April 7, 2003 it appears additional monitoring wells may be required to monitor the performance of the Goitiandia (MU-0050004) and Gillette (MU-0050005) properties. It is recommended that the current Offsite monitoring well network be evaluated, and modified as needed so that it can effectively monitor the environmental performance of the Offsite acreage".

In addition, the 225 MG annual hydraulic loading limit will be deleted from the permit. This limit is not adequate for the current available acreage and other loading limits.

cc: Richard Huddleston, SO
WLAP Source File no. LA-000050-02 (SO & TFRO)